



North Carolina Department of Transportation  
Transportation Program Management Unit - Value Management  
Innovative Technologies and Products Awareness Report  
October 11, 2018

## PRODUCT HIGHLIGHT – Nonwoven Geotextile as a Drainage Layer



*Geotextile layer beneath concrete pavement*

When Portland Cement Concrete Pavement (PCCP) is used for paving a new roadway, an interlayer is needed for drainage purposes between the subgrade and concrete. Without the drainage layer, water can become trapped beneath PCCP which can result in loss of support in the underlying subgrade. In the past, NCDOT has used a permeable asphalt layer to provide the drainage beneath PCCP. Recently, states have started using nonwoven geotextile as an interlayer to provide drainage beneath PCCP. The geotextile provides horizontal drainage capabilities as well as faster construction times than asphalt, potential material cost savings, and more access through the worksite during construction. For installation, the geotextile is unrolled and nailed or stapled to a separator layer on top of the subgrade. PCCP is then spread over the top. The edge of the geotextile is tied to shoulder drains for the water to disperse. Contractors must schedule carefully as geotextile should not be exposed to sunlight for more than seven days.

NCDOT has been evaluating using geotextile as a drainage layer beneath concrete paving since its first use in North Carolina in 2014 at a weigh station project. It was implemented on a 5-mile section of the Greensboro Loop due to a Value Engineering study requested by the contractor, which was accepted by the Department. The geotextile drainage layer saved almost \$556,000 in construction costs compared to the originally planned asphalt pavement layer. Cost savings were attributed to materials and construction time to complete. The nonwoven geotextile interlayer has recently been added to Section 724 of NCDOT's Standard Specifications.



*Geotextile being rolled out prior to paving*

## PRODUCT INNOVATION – Signal Retiming

Signals along a roadway corridor are often linked with a signal timing system. These timing systems help to alleviate congestion by maximizing the efficiency of the travel movements. Signal system performance degrades over time due to traffic growth, development, and changes in capacity, therefore corridors must occasionally be retimed. Retiming signal systems is a way to adapt to these factors for improving signalized congestion.

NCDOT has a large network of signalized systems – 2,400 signals within 381 signal systems across the state. The Central Office System Timing (COST) group supports NCDOT Divisions in maintaining these signalized systems. Historically, the process of prioritizing systems needing retiming has been based off input from Divisions and a 3-year retiming cycle. This year, in an effort to move towards a more data-driven process, COST has created a tool using GPS probe data purchased from HERE. With the assistance of ITRE and Kittelson & Associates, Inc., COST is able to develop an annual prioritization process for COST by comparing the data at specific locations across the state from previous years. The prioritization process results in a ranking system based off travel times, travel time reliability, and trends. The greater the difference in travel times, travel time reliability, and trends, the more the system has degraded. Having a data-driven priority list will ensure that state resources are spent in the most effective way possible by managing the signal system retiming in a more proactive manner.

